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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/553,199	10/13/2005	Koji Tokuda	279096US3PCT	1253
22850	7590	04/04/2008		
OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			EXAMINER YANG, JIE	
			ART UNIT 1793	PAPER NUMBER
			NOTIFICATION DATE 04/04/2008	DELIVERY MODE ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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<b>Office Action Summary</b>	<b>Application No.</b> 10/553,199	<b>Applicant(s)</b> TOKUDA ET AL.	
	<b>Examiner</b> JIE YANG	<b>Art Unit</b> 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 2/26/2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) 11-14 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 October 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>12/13/07;9/11/07;10/13/05</u>                                 | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

The reference of US 5,413,471 listed on the IDS filed 09/11/2007 is crossed out since it is unrelated to the instant application.

### ***Election/Restrictions***

Applicant's election of "Group I—Claims 1-10, drawn to a "method of producing reduced iron" in the reply filed on 02/26/2008 is acknowledged without traverse (MPEP 818.03(a)).

Claims 11-14 are withdrawn from consideration as being directed to a non-elected group and claims 1-10 are pending for examination.

### ***Claim Rejections - 35 USC § 102***

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-4 are rejected under 35 U.S.C. 102(b) as anticipated by Kamikawa et al (US 6,413,471 B1, thereafter US'471).

Regarding claims 1 and 2, US'471 teaches a process for producing reduced iron in a rotary hearth furnace (Abstract, col.1, lines 6-12 of US'471). US'471 teaches mixing an iron ore powder, a coal powder, a fluxstone (limestone) powder, and a binder to form reduced iron compacts, which reads on the feedstock containing a carbonaceous reductant and an iron oxide-containing material as recited in the instant claims. US'471

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teaches feeding, high temperature atmosphere (in which heating/reducing, melting steps are performed), and discharge portion (in which cooling, and discharging steps are performed) (Col.1, lines 13-23, and Col.2, line 47 to col.3, line 3 of US'471), which reads on the claimed process steps as recited in the instant claims. US'471 teaches air flow controlling partitions (Col.3, line 38 to Col.4. line 33 of US'471), which reads on flow rate-controlling partitions as recited in the instant claims. US'471 teaches controlling the pressure of furnace, for example keeping the interior of the furnace at a negative pressure (Col.2, lines 15-45 of US'471), which reads on the limitation of maintaining the cooling step at higher pressure than that of the furnace gas in other steps as recited in the instant claim 2.

Regarding claims 3 and 4, US'471 teaches providing partitions at least between a heating zone, a CO ratio control zone, and reducing atmosphere zone in the high temperature atmosphere space portion (Fig.6, claim 13, and col.10, lines 6-53 of US'471), which teaches the divided zones and partition location as recited in the instant claims 3 and 4. US'471 further teaches the gas in the high temperature space portion flows in the direction of an arrow G (Refer to the figure 6 of

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US'471) and is discharged through the off-gas duct (Col.7, lines 35-54 of US'471), which reads on the limitation of discharging the furnace gas from the furnace gas outlet as recited in the instant claim 3.

Therefore, claims 1-4 are anticipated by US'471.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 5-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over US'471.

Regarding claims 5-10, US'471 teaches moving the partitioning member upward and downward to adjust the height position of the partitioning member in order to adjust the gap between a lower end portion of the partition member and the compacts to a appropriate level. Consequently, flow of air inside the furnace can be suppressed reliably, and damage to the partitioning member can be prevented (Col.4, lines 8-22 of US'471). Though US'471 does not specify at least one of the

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partitions has one or more vertically movable perforations as claimed in the instant claims 5-10 to control the flow of furnace gas (claims 6, 8, and 10) and/or by varying the aperture of the one or more perforations as recited in the instant claims 8 and 10, the vertical movable partition in US'471, which will lead to the gap changing between a lower end portion of the partition member (Col.4, lines 8-22 of US'471). This gap changing would be a functional equivalent to the claimed varying the aperture of vertically movable perforations in term of air flow-controlling function. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute the vertical movable partition with the partition with a vertically movable and/or variable perforations to control the air flow in the process of US'471, because substitution of equivalents would be within the expected skill in the art with expected success. See MPEP 2144.06.

Claims 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over US'471 in view of Kansa et al (US 6,478,839 B1, thereafter, US'839).

regarding the limitation that the flow of the furnace gas is controlled by varying the aperture of the one or more perforations in the instant claims 8-10, it is a well known

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technique to control the opening/closing of through hole on a partition plate in order to control the gas flow in a chamber, which is evidenced by US'839. US'839 teaches a method of induction-heat-melting treatment of metal-oxide powders (Abstracts, col.1, lines 8-15 of US'839). US'839 teaches controlling opening and closing the hole on a partition plate to control the vacuum in the chamber (through control the gas flow— noted by the examiner) (Col.5, line 35 to Col.6, line 26 of US'839). Therefore, applying a well known technique controlling opening and closing the hole on a partition plate in the process of US'471 as claimed in the instant claim for the purpose of controlling the gas flow as disclosed by US'839 would have been obvious to one of the ordinary skill in the art.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jie Yang whose telephone number is 571-2701884. The examiner can normally be reached on IFP.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on 571-2721244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JY

/Roy King/

Supervisory Patent Examiner, Art Unit 1793